



**Blue Grass Energy
Cooperative Corporation**

PO Box 990
1201 Lexington Road
Nicholasville, Kentucky 40340-0990
Phone: (859) 885-4191
Fax: (859) 885-2854

October 1, 2004

Beth O'Donnell Executive Director
Kentucky Public Service Commission
P O Box 615
Frankfort Kentucky 40602

RECEIVED

OCT 04 2004

PUBLIC SERVICE
COMMISSION

Dear Ms. O'Donnell,

We are filing an original and 5 copies as requested by the Public Commission staff's first data request. This relates to Case No. 2004-00251, Application of Blue Grass Energy Cooperative Corporation for a certificate of convenience and necessity for its 2004-2005 construction work plan. If you have any questions, please contact me at (859) 885-2114. As always, your continued assistance and cooperation is appreciated.

Sincerely,

A handwritten signature in cursive script that reads "Chris Brewer".

Chris Brewer
Vice President, Engineering

1. Line Conversions

- Conversion 336-14 does call for a conversion to Vee-phase 1/0 ACSR, while conversion 385-34 calls for a conversion to Vee-phase 2 ACSR. The area around conversion 385-34 is considered a low growth potential area and thus the 2ACSR was called for on this project. The area around conversion 336-14 is considered a higher growth area and thus the 1/0 ACSR was called for on this project.

Person Responsible: Chris Brewer (859-885-2114)

2a. Automated Meter Reading (AMR) Project Feasibility Study

Purpose: The need to control future meter reading cost as well as improve customer satisfaction.

Contract meter reading and automated meter reading were extensively researched and a comparison analysis completed to make a decision on which type would be most beneficial to our company and customers.

The following information was gathered and used in making the determination to implement the Automated Meter Reading (AMR) Project.

Assumptions:

- Growth in meters at 2.5%.
- Labor inflation at 3.0%.
- Interest rate at 4.0%.
- AMR module failure rate at 0.4%.
- Life of project-15 years.

Meter Reading Costs:

- Contract total fifteen (15) year cumulative cost of \$12,262,509 vs. Automated total investment cost of \$11,678,128. Comparing the AMR investment to contract meter reading a cumulative cash flow savings of \$584,381 is realized.
- There are twenty-six (26) reader complaints per year resulting from contract meter reading. Statistically, nine (9) out of ten (10) customers will not call. Therefore, there is the possibility of 260 complaints annually. These will be eliminated with an AMR system.
- **A positive impact would be gained from implementing AMR system.**

Operational Costs:

- Service Technicians-spend 50-60% of time doing read in/out. Approximately 50% of service orders involve read in/out. Therefore, a savings of 42% in service technicians' labor can be projected.
- Total cumulative savings of \$4,365,957 and average annual savings of \$291,064.
- **A positive impact would be gained from implementing AMR system.**

Increased Meter Revenue:

- Based on other AMR projects, an increase in meter revenue up to 0.5% is projected as a result of recalibrating and replacing meters. A conservative projection is for a 0.2% revenue increase.
- Total cumulative savings of \$1,724,125 and an average annual savings of \$114,942.
- **A positive impact would be gained from implementing AMR system.**

Increased Revenue:

- Revenue should increase due to the decrease in time by three (3) days between the reading date and the billing date.
- Total savings of \$515,189.
- **A positive impact would be gained from implementing AMR system.**

Sample Meter Cost:

- There will be a reduction in sample meter testing costs for eight years. Approval has been granted to sample test new meters as they are deployed.
- Total cumulative savings of \$242,983 and average annual savings of \$30,373.
- **A positive impact would be gained from implementing AMR system.**

Support Fee Cost:

- There will be an increase in support fee costs as a result of deploying the AMR system.
- Total cost of \$167,390
- All of the above leads to a total Cumulative Operational Savings of \$6,680,864.
- **A negative impact would be incurred from implementing AMR system.**

Billing complaints (Office Services):

- A ten (10) percent savings is projected.
- Total cumulative savings of \$319,900 and average annual savings of \$21,327.
- **A positive impact would be gained from implementing AMR system.**

Billing complaints (Energy Advisors):

- It is estimated that thirty (30) percent of our Energy Advisors' time is spent on high bill complaints. This can be eliminated by consistent reads with the AMR system.
- Total cumulative savings of \$491,648 and average annual savings of \$32,777.
- **A positive impact would be gained from implementing AMR system.**

System Losses:

- There will be a projected savings of 0.2% of the power bill in improved line loss. The savings will occur due to system maintenance during the AMR deployment, power factor improvement, and increased accuracy of system load planning as a result of KW reading from each meter.
- Total cumulative savings of \$1,224,348 and average annual savings of \$81,623.
- **A positive impact would be gained from implementing AMR system.**

Blinking Lights:

- Due to our current reactive response to blinking lights, the customer has to issue a complaint before we are aware of power quality problems.
- The AMR system will identify any customers experience blinking lights through the daily meter reading reports.
- This allows us to become more proactive in our response.
- **A positive impact would be gained from implementing AMR system.**

Failure Rate:

- There is a projected failure rate of 0.4% for the AMR modules based on the manufacturer's published failure rate.
- Total cumulative cost of \$394,735 and average annual cost of \$7,368.
- **A negative impact would be incurred from implementing AMR system.**

Based on the preceding analysis, Blue Grass Energy decided that the AMR system would be greatly beneficial in enhancing customer satisfaction, reducing long-term costs, and improving the overall process. The positive impacts outweigh the negative impact in implementing the AMR system.

The amount of \$7,400,000 indicated in the 2004-2005 Construction Work Plan for the Automated Meter Reading (AMR) project is the initial cost for 2004-2008.

The initial investment has been estimated at \$7,309,028 based on calculations involving 51,000 meters, 3,600 modules, substation equipment, and computer equipment. Added to this cost is labor inflation at three (3) percent with an estimated cost of \$90,972. The total amount for the 2004-2008 initial investment is \$7,400,000.

Also, attached are spreadsheets and graphs explaining the cost analysis and graphs completed to make the determination on the initial cost and total investment cost over the life of the project.

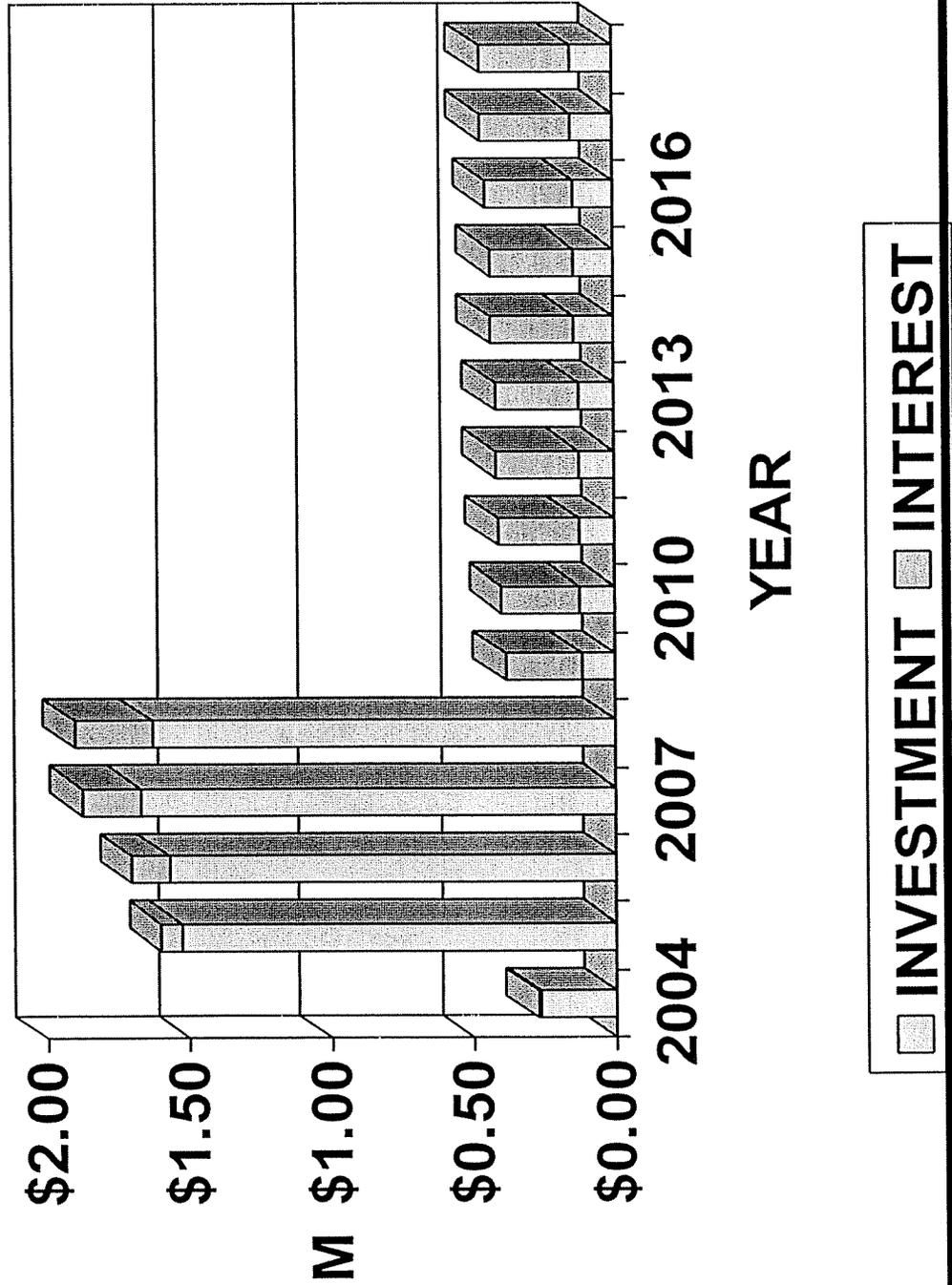
Persons Responsible: Mike Williams (859-885-2155) or Donald Smothers (859-885-2118)

Automated Meter Reading (AMR) Investment Cost Analysis

<u>Description</u>	<u>Amount</u>
2004-2009 Initial Investment (51,000 meters, 3,600 modules, substation and computer equipment)	\$7,309,028.00
Labor Inflation (3%)	\$90,972.00
Total Initial Investment (2004-2008)	<u>\$7,400,000.00</u>
Module Investment (2009-2018)	\$1,027,095.00
Net Investment (Life of Project)	<u>\$8,427,095.00</u>
Failure Rate (0.4%)	\$394,735.00
Meters Normally Purchased (2004-2008)	-\$788,449.00
Net Investment (Life of Project)	<u>\$8,033,381.00</u>
Interest Expense (4.0%)	\$3,644,747.00
Total Investment Cost (Life of Project)	<u>\$11,678,128.00</u>

1

AMR INVESTMENT



Contractor Savings Analysis**Description**

Total Savings

Based on:

15-year Average

Including:

Inflation 2.0%

Growth 2.5%

Amount**\$12,262,509.00**

\$817,505.00

Projected Contractor Rate:

2004

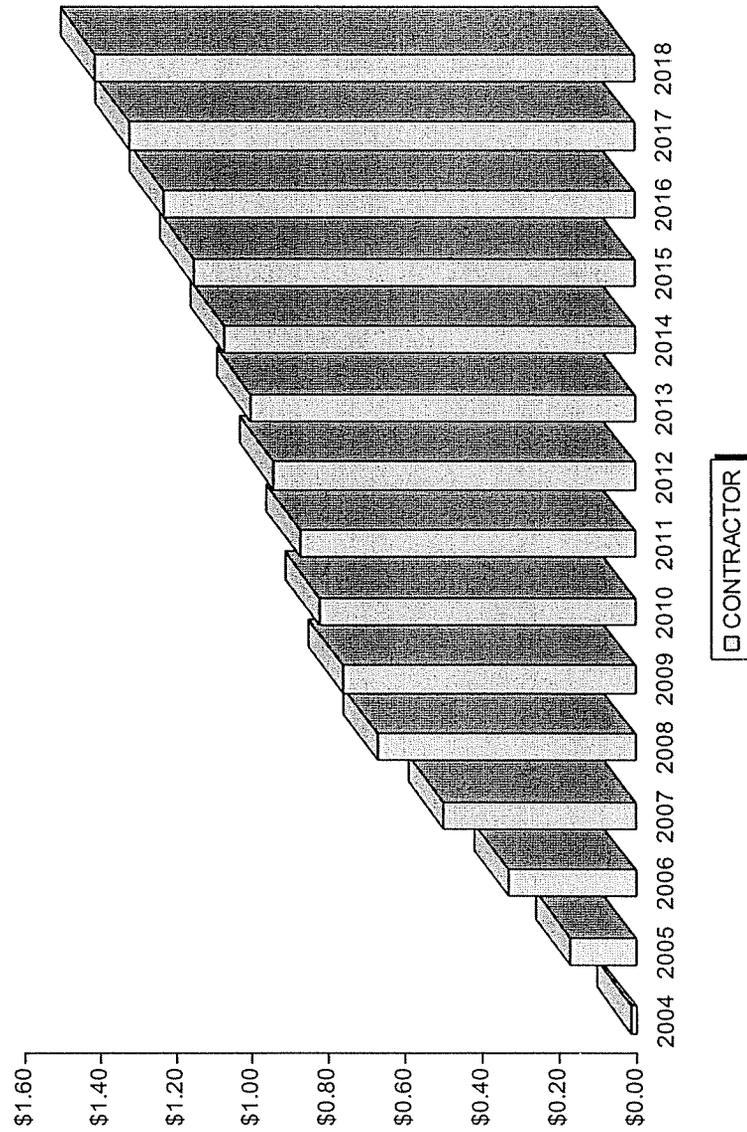
\$0.86

2018

\$1.69

2

CUMULATIVE CONTRACTOR SAVINGS

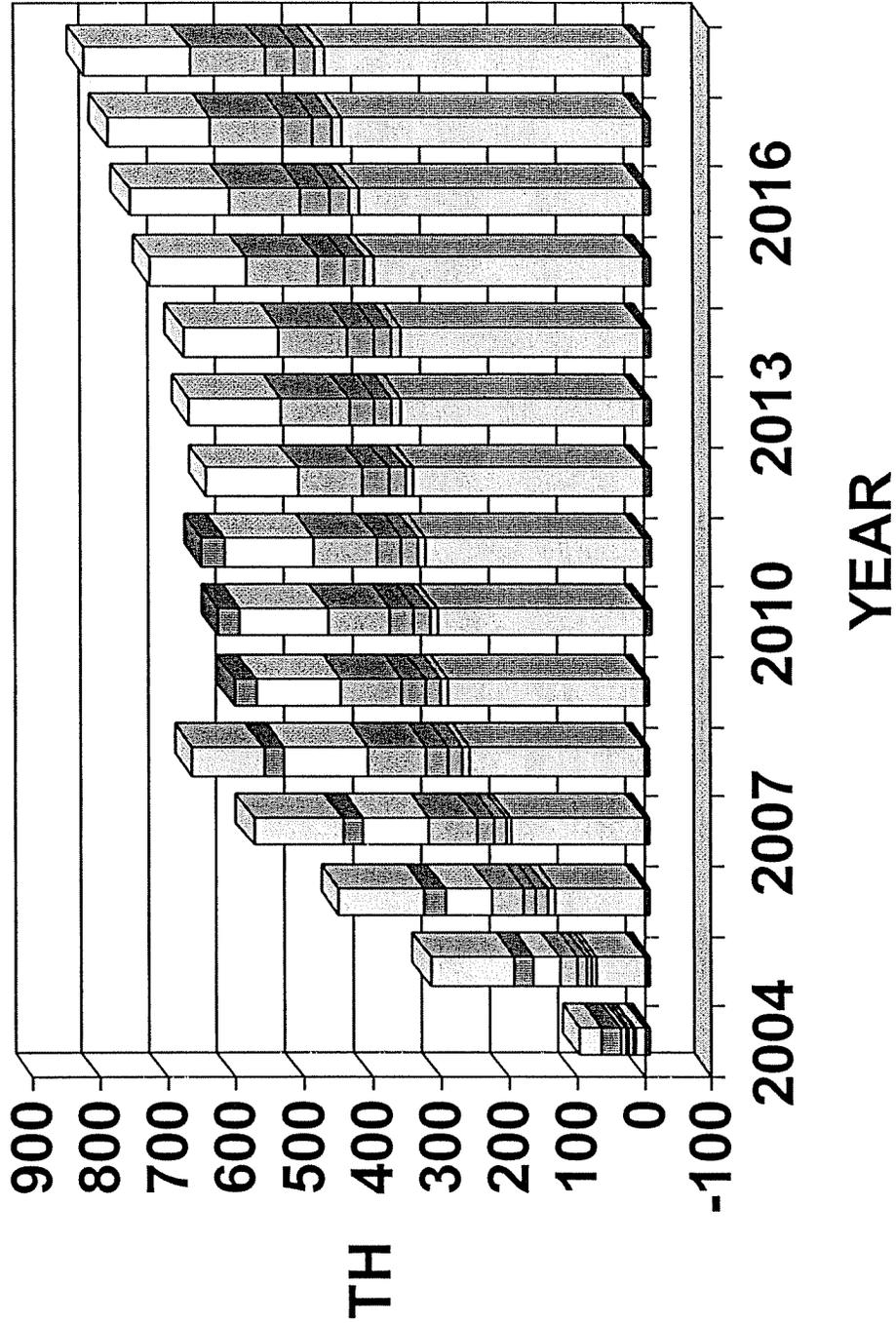


Additional Savings Analysis

<u>Description</u>	<u>Amount</u>
Customer Service (CSR Supervisors 10%)	\$319,900.00
Member Services (Energy Advisors 30%)	\$491,648.00
Operations (Serviceman Readouts 42% SO)	\$4,365,957.00
Improve Line Loss (0.2% of Power Bill)	\$1,224,348.00
New Meter Revenue (0.2% of Revenue)	\$1,724,125.00
Meter Sampling Cost	\$242,983.00
Additional Revenue (Pick up 3 days billing)	\$515,189.00
Support Fee Cost (3% inflation)	-\$167,390.00
Total Additional Savings	<u>\$8,716,760.00</u>

3

TOTAL OTHER SAVINGS



SUMMARY
AUTOMATED METER READING (AMR) INVESTMENT COST AND SAVINGS ANALYSIS

CONTRACTOR COST (2004-2018)		\$12,262,509.00	
INITIAL COST (2004-2008)	\$7,400,000.00		
MODULE INVESTMENT (2009-2018)	\$1,027,095.00		
FAILURE RATE	\$394,735.00		
METERS NORMALLY PURCHASED	<u>-\$788,449.00</u>		
NET INVESTMENT (2004-2018)		\$8,033,381.00	
INTEREST EXPENSE (2004-2018)		<u>\$3,644,747.00</u>	
TOTAL INVESTMENT		<u>\$11,678,128.00</u>	
SAVINGS OF AMR SYSTEM OVER CONTRACTOR			\$584,381.00
ADDITIONAL SAVINGS (2004-2018)			
CUSTOMER SERVICE		\$319,900.00	
MEMBER SERVICES		\$491,648.00	
OPERATIONS		\$4,365,957.00	
IMPROVE LINE LOSS		\$1,224,348.00	
NEW METER REVENUE		\$1,724,125.00	
METER SAMPLING COST		\$242,983.00	
ADDITIONAL BILLING REVENUE		\$515,189.00	
SUPPORT FEE COST		-\$167,390.00	
TOTAL ADDITIONAL SAVINGS			<u>\$8,716,760.00</u>
<u>TOTAL SAVINGS</u>			<u>\$9,301,141.00</u>

2b. Functions of Automated Meter Readers (AMRs)

Hunt Technologies TS-2 system description:

- TS-2 is bidirectional two-way power line carrier from the metering to the substation equipment.
- The TS-2 substation and central server support many user selectable communications media from the utility office to the substation.
- TS-2 is identified as full duplex PLC to all the meters all the time.
- The TS-2 system provides control functions as well as load control.
- TS-2 supports multi-utility water and gas via RF back to the meter and then PLC to the central server.

Meter Functions:

- Outage and restoration information is received back at the central server within 15 minutes of the event.
- Switching or back feeding has no impact on meters.
- Meters can be reconfigured from the office.
- The entire meter population can be read on a specific day and time.
- Daily customer information: Kwh, peak Kw, TOU (all with date and time), blinks, phase identification and system diagnostics (signal strength).
- Three phase meters are capable of up to 150 different data selections and demand resets via PLC from the server.
- Remote disconnect with verification at the central server.
- Momentary outage reports.
- Remote programmable from the central server.
- All meters are continuously monitored and tracked by the system, even when switched to another substation.
- No loss of data during power outages.
- Date and time stamped data packets
- Each meter is assigned a unique frequency allowing continuous and simultaneous data transmission.

Persons Responsible: Mike Williams (859-885-2155) or Donald Smothers (859-885-2118)

3. Project Model

A. Blue Grass Energy has a SCADA system that monitors the amperage on each circuit of the substation. Any significant imbalances are noted and corrected at a time when weather and load permit the phase changes to be completed.

B. The decision was made to use a balanced voltage drop calculation as the basis for the study due to the fact that we were not confident in the accuracies of our current phasing information. We felt that a balanced voltage drop calculation in conjunction with the SCADA information would provide the most accurate information for the work plan study. We are currently updating our phasing information in conjunction with a new mapping system that we are currently implementing. This project should be completed near the end of 2005.

Person Responsible: Chris Brewer (859-885-2114)

4. Unbalanced Voltage Drop Studies

- The studies are not provided due to the reasons listed in responses 3A and 3B.

Person Responsible: Chris Brewer (859-885-2114)

5. Measured and Calculated Voltages:

- Voltage readings to be on a following spreadsheet.

Person Responsible: Chris Brewer (859-885-2114)

Substation	Date	Line Section	Measured Voltage	Calculated voltage
Sinai	9/23/2004	2312	124.6	123.7
Bridgeport	9/23/2004	2104	124.7	125.7
Ninevah	9/23/2004	2435	125.7	125
Four Oaks	9/24/2004	4093	124.4	125.8
Sinai	9/22/2004	2301	124	122.4
Ninevah	9/22/2004	2297	123	124
Newby	9/23/2004	377	124	125.7
W. Berea	9/23/2004	335	124	124.8
Hickory Plains	9/23/2004	415	124	125
North Madison	9/23/2004	172	124	124.1
W. Nicholasville	9/23/2004	34	124	125.9
Fayette 1	9/23/2004	499	124.2	125.9
Fayette 2	9/23/2004	479	124.8	125.8
Holloway	9/30/2004	37	124	123.5